

EM - Edit Mask

Parameter	Possible Values	Default Value	Applicable Statements
EM	see below	none	DEFINE DATA DISPLAY FORMAT INPUT MOVE EDITED PRINT WRITE

With this parameter, you can specify an edit mask for an input and/or output field that is used in a DISPLAY, INPUT, MOVE EDITED, PRINT or WRITE statement.

For input fields, values must be entered exactly matching the edit mask. If it is desired to display the edit mask for an input field, the field should be defined as modifiable (AD=M).

For a database field, a default edit mask may have been defined in the DDM. If you specify with the EM parameter an edit mask for a database field, this edit mask specified will be used instead of any default edit mask which may be defined for the field in the DDM.

If you specify EM=OFF for a field, no edit mask will be used for the field, not even one that may be defined in the DDM.

At statement level of a DISPLAY, FORMAT, INPUT or WRITE statement, no detail field edit mask may be specified, except EM=OFF.

An edit mask overrides any settings for the session parameters AL, NL and SG.

Examples:

```
DISPLAY AA(EM=OFF) AB(EM=XX.XX)
WRITE SALARY (EM=ZZZ,ZZ9)
```

An abbreviated notation can be used for long edit masks. The following examples demonstrate the abbreviated notation which may be used for numeric, hexadecimal, and alphanumeric edit masks:

EM=9(4)-9(5) is equivalent to: EM=9999-99999

EM=H(10) is equivalent to: EM=HHHHHHHHHH

EM=X(6)..X(3) is equivalent to: EM=XXXXXX..XXX

This notation may be used only with the characters "9", "H", "X" and "Z" which represent significant print positions in the numeric, hexadecimal, and alphanumeric edit masks.

Blanks in Edit Masks

Blanks within an edit mask are represented by the character on your keyboard which in hexadecimal code corresponds to H'20' (ASCII) or H'5F' (EBCDIC) respectively, that is, the character "^" (or "¬").

Default Edit Masks

If no edit mask is specified for a field, a default edit mask is assigned to the field depending on the field format:

Field Format	Default Edit Mask
A	X
B	H
N, P, I	Z9
F	scientific representation
D	depends on default date format (as set with the profile parameter DTFORM)
T	HH:II:SS
L	blank / X

Edit Masks for Numeric Fields

An edit mask specified for a field of format N, P, I, or F must contain at least one "9" or "Z". If more 9s or Zs exist than the number of positions contained in the field value, the number of print positions in the edit mask will be adjusted to the number of digits defined for the field value. If fewer 9s or Zs exist, the high-order digits before the decimal point and/or low-order digits after the decimal point will be truncated.

Two options are available when using numeric edit masks. The first option allows the insertion of a special character as the first character in the edit mask.

Characters for the Definition of Numeric Edit Masks:

Character	Function
9	Position to be displayed (one digit of the field value).
Z	Zero suppression for leading zeros. This is the default for numeric fields. The letter "Z" may be repeatedly specified to represent floating zero suppression. A "Z" must not be specified to the right of the decimal point. A zero value may be displayed as blanks using all "Z"s in the edit mask (see also the session parameter ZP).
+	A floating sign is to be displayed preceding/following the number. The sign may be generated as a plus or minus depending on the value of the field.
-	A floating minus is to be displayed preceding/following the number if the value of the field is negative.
S	A sign is to be displayed to the left of the value. A plus sign is displayed for a positive value and a minus sign is displayed for a negative value. If "S" is used, it must be specified as the first character in an edit mask.
N	A minus sign is to be displayed to the left of the column if the value of the field is negative.
.	A period, if used as the first character, represents a decimal position and is significant.
H	Designates the beginning of a hexadecimal edit mask. If an "H" appears as the first position, all other character which are not "H" will be considered insertion characters.

The second option allows any number of leading characters to appear prior to the first displayable position (as indicated with the digit "9"). The first of these leading characters must not be any of the edit characters described above unless enclosed in quotes. The first of these insertion characters specified will appear in the output only if the value contains leading zeros and the edit mask is defined with Z (leading zero suppression). This character will then be displayed instead of a blank for leading zeros.

Both options permit the use of insertion and trailing characters. The symbol (^) may be used to represent a leading, inserted, or trailing blank. By enclosing significant characters (9, H, Z, X) in apostrophes, it is possible to use any characters as leading, insertion, or trailing characters. Insignificant edit mask characters need not be enclosed in apostrophes. Within the same edit mask notation, it is possible to have groups of leading, insertion, and/or trailing character strings, some of which are bounded by apostrophes and some of which are not.

A trailing sign character can be specified for numeric edit masks by using the "+" or "-" characters as the last character in the edit mask. A "+" will produce a trailing "+" or "-" sign depending on the value of the field. A "-" will produce a trailing space or "-" sign depending on the value of the field. If a leading and trailing sign are specified in the edit mask, both will be produced.

Examples of Numeric Edit Masks:

The table below lists the results obtained from the original values shown at the top of each column as they are output without editing mask. All values used as column headings represent N format fields. The lines below the top column represent the formats obtained using the different editing masks:

Value	0000.03 (N4.2)	-0054 (N4)	+0087 (N4)	0962 (N4)	1830 (N4)
Edit Mask					
EM=9.9	0.0	4.	7.	2.	0.
EM=99	00	54	87	62	30
EM=S99	+00	-54	+87	+62	+30
EM=+Z9	+0	-54	+87	+62	+30
EM=-9.99	0.03	-4.	7.	2.	0.
EM=N9	0	-4	7	2	0
EM=*9.99	0.03	4.	7.	2.	0.
EM=Z99	00	54	87	962	830
EM=*DMZZ9.9	DM**0.0	DM*54.	DM*87.	DM962.	DM830.
EM=999+	000+	054-	087+	962+	830+
EM=999-	000	054-	087	962	830
IC=\$ EM=ZZZ.99	\$.03	\$54.	\$87.	\$962.	\$830.
EM=H(6)					
- ASCII:	303030303033	30303574	30303837	30393632	31383330
- EBCDIC:	F0F0F0F0F0F3	F0F0F5D4	F0F0F8F7	F0F9F6F2	F1F8F3F0

By combining edit masks with the parameters IC and TC, negative numbers can be displayed in varying formats using a DISPLAY statement.

Edit Masks for Alphanumeric Fields

An alphanumeric edit mask which is only to be used with A format fields must contain at least one "X" which represents a character to be displayed. An "H" as the first character designates a hexadecimal edit mask. A blank is represented by a (^) symbol. All other characters except parentheses are permissible including leading, trailing, and insertion characters. It is also possible to specify leading, insertion, or trailing characters enclosed within apostrophes. If the character "X", a closing parenthesis, or a quotation mark is specified as an insertion character, it must be enclosed within apostrophes.

If leading characters are used before the first displayable position X, the first of these leading characters will not be displayed. Trailing characters which immediately follow the last permissible print position will be displayed.

The number of positions to be displayed will be adjusted to the length of the edit mask if the mask is shorter than the field.

Example of Alphanumeric Edit Masks:

The following program lists the alphanumeric edit masks for a field that is defined with format/length A4 and contains the value "BLUE".

```
* EXAMPLE 'EMMASK1'
  DEFINE DATA LOCAL
    1 #TEXT (A4) INIT <'BLUE'>
  END-DEFINE
  WRITE NOTITLE 'MASK 1:' 5X #TEXT (EM=X.X.X.X)
    /           'MASK 2:' 5X #TEXT (EM=X^X^X^X)
    /           'MASK 3:' 5X #TEXT (EM=X--X--X)
    /           'MASK 4:' 5X #TEXT (EM=X-X-X-X-X-X)
    /           'MASK 5:' 5X #TEXT (EM=X' 'X' 'X' 'X)
    /           'MASK 6:' 5X #TEXT (EM=XX...XXX)
    /           'MASK 7:' 5X #TEXT (EM=1234XXXX)
  END
```

MASK 1:	B.L.U.E
MASK 2:	B L U E
MASK 3:	B--L--U
MASK 4:	B-L-U-E-
MASK 5:	B L U E
MASK 6:	BL...UE
MASK 7:	234BLUE

Hexadecimal Edit Masks

If the character "H" is specified as the first character in an edit mask, the content of an alphanumeric or numeric field will be displayed in hexadecimal format. Each "H" represents two print positions that will occur for each byte in the source field. Characters other than "H" serve as insertion or trailing characters in the mask. The number of positions to be displayed will be adjusted to the length of the edit mask if the mask is shorter than the field. The length of the edit mask will be adjusted to the length of the field if the field length is shorter than the edit mask.

Insertion or trailing characters may be optionally specified bounded by apostrophes.

All fields displayed with a hexadecimal edit mask are treated as alphanumeric. Therefore, if the edit mask is shorter than the field to be edited, numeric or alphanumeric positions will be displayed from left to right disregarding any decimal point positions.

Edit Mask Examples for Hexadecimal Fields:

The tables below list the hexadecimal edit masks with results obtained from the original fields and values shown above each column. All numeric values ("-10", "+10", "01") to which edit masks have been applied originated in fields defined with N2 format. The alphanumeric value "AB" originated from a field defined with format/length A2.

ASCII:

Value ->	AB	-10	+10	01
EM=HH	4142	3170	3130	3031
EM=H^H	41 42	31 70	31 30	30 31
EM=HH^H	4142	3170	3130	3031
EM=H-H	41-42	31-70	31-30	30-31
EM=H	41	31	31	30

Note:

In the case of em=h(n) (Hexadezimal-Output) the value of n must be in the range of $1 \leq n \leq 126$. Is $n > 126$, then an error will be displayed if the variable has more than 126 elements.

Example:

```
A (A100) := 'A'      /* 100 characters/elements
PRINT A (EM=H(200)) /* no errorr, as 100<=126, even if 200>126
END
```

EBCDIC:

Value ->	AB	-10	+10	01
EM=HH	C1C2	F1D0	F1F0	F0F1
EM=H:H	C1 C2	F1 D0	F1 F0	F0 F1
EM=HH:H	C1C2	F1D0	F1F0	F0F1
EM=H-H	C1-C2	F1-D0	F1-F0	F0-F1
EM=H	C1	F1	F1	F0

Edit Masks for Date and Time Fields - Formats D and T

In edit masks for fields which are defined with format D (date) or T (time), the following characters can be specified:

Date - format D, and Time - format T:

Character	Usage
DD	Day.
ZD	Day, with zero suppression.
MM	Month.
ZM	Month, with zero suppression.
YYYY	Year, 4 digits.
YY	Year, 2 digits. (If used for input fields, the current century is concatenated before the input value.)
Y	Year, 1 digit. Must not be used for input fields.
WW	Number of Week.
ZW	Number of Week, with zero suppression.
JJJ	Julian day.
ZZJ	Julian day with zero suppression.
NN... or N(n)	Name of Day (language-dependent). The maximum length is determined by the number of N's or by n. If the name is longer than the maximum length, it will be truncated; if it is shorter, the actual length of the name will be used.
O	Number of week day (Monday = 1, Tuesday = 2, etc.). The profile parameter DTFORM determines whether Monday or Sunday is considered the first day of the week.
LL... or L(n)	Name of Month (language-dependent). The maximum length is determined by the number of L's or by n. If the name is longer than the maximum length, it will be truncated; if it is shorter, the actual length of the name will be used.
R	Year in Roman numerals (maximum 13 digits).

If only year (YY or YYYY) but no month or day is specified within an input edit mask, the values for month and day will both be set to "01". If only year (YY or YYYY) and month (MM) but no day is specified within an input edit mask, the value for day will be set to "01".

If a week is displayed which belongs to the previous or the next year, the display for year is modified accordingly.

Whether a week is week 53 of the old year or week 1 of the new year, depends on which year the Thursday of that week belongs to: if the Thursday is in the old year, the week belongs to the old year; if it is in the new year, the week belongs to the new year.

Note:

"MM" (or "ZM") and "LL" (or "L(n)") must not be specified together in an edit mask. "NN" (or "N(n)") and "O" must not be specified together in an edit mask.

Time - format T - only:

Character	Usage
T	Tenths of a second.
SS	Seconds.
ZS	Seconds, with zero suppression.
II	Minutes.
ZI	Minutes, with zero suppression.
HH	Hours.
ZH	Hours, with zero suppression.
AP	AM/PM element.

Examples of Date and Time Edit Masks:

```

*      EXAMPLE  'EMDATI' EDIT MASKS FOR DATE AND TIME
*****
WRITE NOTITLE
'DATE INTERNAL : ' *DATX (DF=L) /
'              : ' *DATX (EM=N(9)' 'ZW.'WEEK 'YY) /
'              : ' *DATX (EM=ZZJ' .DAY 'YYYY) /
'      ROMAN   : ' *DATX (EM=R) /
'      AMERICAN : ' *DATX (EM=MM/DD/YYYY) 12X 'OR ' *DAT4U /
'      JULIAN   : ' *DATX (EM=YYYYJJJ) 15X 'OR ' *DAT4J /
'      GREGORIAN: ' *DATX (EM=ZD.' 'L(10)' 'YYYY) 5X 'OR ' *DATG ///
*
'      TIME INTERNAL : ' *TIMX 14X 'OR ' *TIME /
'                  : ' *TIMX (EM=HH.II.SS.T) /
'                  : ' *TIMX (EM=HH.II.SS' 'AP) /
'                  : ' *TIMX (EM=HH)
END

```

```

DATE INTERNAL : 2001-01-02
               : Tuesday 1.WEEK 2001
               : 2.DAY 2001
      ROMAN    : MMI
      AMERICAN : 02/01/2001 OR 01/02/2001
      JULIAN    : 200102 OR 200102
      GREGORIAN: 2.January 2001 OR 2 January 2001

TIME INTERNAL : 10:40:59 OR 10:40:59.5
               : 10.40.59.5
               : 01.40.59 PM
               : 13

```

Edit Masks for Logical Fields - Format L

For fields of format L (logical fields), edit masks can be defined as follows:

(EM = [false-string] true-string)

The false-string must not be longer than 31 characters.

Example of Edit Masks for Logical Field:

```

/* EXAMPLE 'EMLOGV'
/* EXAMPLE OF LOGICAL VARIABLE IN LOGICAL CONDITION
/*****
DEFINE DATALOCAL
  1 #SWITCH (L) INIT <TRUE>
  1 #INDEX (I1)
END-DEFINE
/*****
FOR #INDEX 1 5
  WRITE NOTITLE #SWITCH (EM=FALSE/TRUE) 5X 'INDEX =' #INDEX
  WRITE NOTITLE #SWITCH (EM=OFF/ON) 7X 'INDEX =' #INDEX
  IF #SWITCH
    MOVE FALSE TO #SWITCH
  ELSE
    MOVE TRUE TO #SWITCH
  END-IF
/*****
SKIP 1
END-FOR
END

```

TRUE	INDEX =	1
ON	INDEX =	1
FALSE	INDEX =	2
OFF	INDEX =	2
TRUE	INDEX =	3
ON	INDEX =	3
FALSE	INDEX =	4
OFF	INDEX =	4
TRUE	INDEX =	5
ON	INDEX =	5

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